

<p>What is the independent variable?</p> <p><b>Amount of sugar used to grow plants</b></p>	<p>What is the dependent variable?</p> <p><b>Growth of plants</b></p>	<p>What is missing from this experiment?</p> <p><b>Control group- Plants grown without sugar</b></p>	<p>Design an experiment to test if adding sugar helps plants grow.</p>
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- 1) Place 50 seeds of a plant in soil and water with a solution containing 10 g of sugar.**
- 2) Place 50 seeds of a plant in soil and water with a solution containing 5 g of sugar**
- 3) Place 50 seeds of a plant in soil and water with only water**
- 4) Give all of the plants the same amount of sunlight**
- 5) Measure the height of all of the plants every week and record in a data chart.**

<ul style="list-style-type: none"><li><b>-large sample size</b></li><li><b>-experimental and control groups</b></li><li><b>-constants</b></li><li><b>-how you measure the dependent variable</b></li></ul>
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Objective: Given an experiment students will be able to identify the independent and dependent variables, control and experimental groups.


Agenda: Warm Up (check study guide)

Pg 9 in pink packet

Experimental Design

Homework: Finish Study Guide- Due tomorrow/will be collected on Friday

Test on Friday!!!!

Questions <span style="color: red;">Pg 9</span>	Winter Roads Case Study answers
<p>1. What abiotic factor(s) have people changed?</p> <p><b>Physical/chemical</b></p>	<p>People have added salt (abiotic) to roads. People have changed land from forested to roads.</p>
<p>2. Why do people change the abiotic factor? Why does it help us?</p> <p><b>Urbanization</b></p>	<p>People add salt to melt ice/snow to make roads safe. More roads=more runoff</p>
<p>3. What are the consequences to the living (biotic) and non-living (abiotic) parts of the ecosystem of that abiotic change?</p> <p>Use the terms abiotic and biotic in your answer.</p>	<p><u>Abiotic</u> : increased runoff = increased erosion of stream banks. Increased salinity <u>Biotic change</u>: Death of some plants/animals</p>
<p>4. How do you know these are the consequences?</p> <p>Describe the evidence or data that support the claim that changing this abiotic factor impacts the surroundings.</p>	<p>Graphs show increased salinity in urban and suburban streams in winter.</p> 

### Reviewing Scientific Method

- Work together for the next 25 minutes to complete this packet.
- After you have completed the first page (front/back) go to weebly and check your answers. (Weebly Sept 18th)
- The last page will be ripped off and turned in as an exit card. (Put your name on it)

Turn to next slide for definitions

**Dependent Variable:** What is being measured

**Independent Variable:** Difference between the control group and experimental group (what is being changed)

**Experimental group:** People/Plants/tests that have had the independent variable changed

**Control Group:** People/Plants/tests done under normal conditions (without independent variable changed)

**Hypothesis:** If...(what you change) then (what you expect to happen)

**Controlled Variable/Constants-** What is the same in all the experimental and control groups

**Procedures:** Show that you have large sample sizes in all groups, Identify what is the same in all groups (constants), Identify how you will measure the dependent variable, Identify how you will change the independent variable



### EXPERIMENTAL DESIGN

**Directions:** Read the following experiments and fill in the blanks that follow. **For 3 and 4 answers, there is not a control group listed in the example.**

1. A study was created to test the effects of jazz on people's sleep patterns. The hypothesis of the experiment was that if people listened to jazz music as they fall asleep, they will sleep for longer periods of time. For the experiment, 2 groups of people were created. One group was placed in a quiet room where they went to sleep and they were timed on how long they slept. The other group was placed in a room where jazz music played softly as they began to sleep and played throughout the night. As each group awoke, their sleep times were monitored.



**Hypothesis:** *A testable statement, set up as: "If (we do this), then (this will happen)."*

*So for this one, the hypothesis would be: If (people hear jazz as they fall asleep), then (they will sleep longer).*

**Dependent Variable:** \_\_\_\_\_ **Control Group:** \_\_\_\_\_

**Independent Variable:** \_\_\_\_\_ **Experimental Group:** \_\_\_\_\_

2. A study was created to test the effects of fear in children. The hypothesis of the experimenters was that if babies were exposed to fuzzy bunnies and at the same time a loud cymbal was struck close behind them, then that child would be afraid of all fuzzy things. Another group of children would be exposed to bunnies without any loud noises. The study was carried out as planned and as a result, hundreds of young children developed fear of all cute furry bunny rabbits.



**Hypothesis:** \_\_\_\_\_

**Dependent Variable:** \_\_\_\_\_ **Control Group:** \_\_\_\_\_

**Independent Variable:** \_\_\_\_\_ **Experimental Group:** \_\_\_\_\_



3. A farmer has noticed that a certain kind of beetle is eating his organic tomato crops. He cannot put pesticide on his plants and still call them “organic”, but the farmer read online that the chemicals in hot peppers can make pests leave his plants alone. He makes a spray out of water and hot peppers and sprays half of his tomato crops with the hot pepper mixture and half with just water.



**Hypothesis:** \_\_\_\_\_

**Dependent Variable:** \_\_\_\_\_ **Control Group:** \_\_\_\_\_

**Independent Variable:** \_\_\_\_\_ **Experimental Group:** \_\_\_\_\_



**B:** Suzie Q wants to know the effect of different colors of light on the growth of plants. She has set ups with white light, blue light, green light, red light, and a closet and 50 small ferns. Design an experiment for Susie to test the effect of the color of light on the growth of plants.

Hypothesis: \_\_\_\_\_

Independent Variable: \_\_\_\_\_ Dependent Variable: \_\_\_\_\_

Control Group: \_\_\_\_\_ Experimental Group: \_\_\_\_\_

What could be the controlled variables (constants)? \_\_\_\_\_

Procedure: (What would she do?)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## Analyzing “Clickbait” on the Internet!

Exit Card Write your name on this

### **Does Sniffing Rosemary Increase Memory by 75 Percent?**

<https://www.snopes.com/fact-check/sniffing-rosemary/>



From “Snopes.com”: Rosemary has long been associated with memory enhancement in classical literature and in folklore. The herb makes a notable cameo in Shakespeare’s *Hamlet*, for instance, when Ophelia describes the rosemary as “for remembrance.” More recently, the internet has been littered with a specific claim about rosemary and memory that purports to be scientific evidence in favor of this classically held notion: “Sniffing the herb can increase memory by 75%.” This assertion can be found on all the usual pseudoscientific natural health websites. “The results were remarkable: people had 60 to 75% chances of remembering things, compared with people who were not given rosemary essential oil!” Natural News **exclaimed**. “Study: Smelling Rosemary Increases Memory by 75%” proclaimed a David “Avocado” Wolfe **headline**. These claims apparently stem from an article in *Daily Mail* that mentioned a small, informal study done by a psychology student, not a large study. A large study has never been done to test this.

Design an experiment to test the claim that sniffing rosemary increases memory:

Hypothesis: \_\_\_\_\_

Independent variable: \_\_\_\_\_ Dependent Variable: \_\_\_\_\_

Control group: \_\_\_\_\_ Experimental Group: \_\_\_\_\_

Materials (remember, bigger test groups are better!): \_\_\_\_\_

Controlled Variables (Constants): \_\_\_\_\_

Procedure: (make a numbered list of what you would do including what you would measure and how you would measure it)